Remarks.

It is respectfully solicited that the rejection of claims 15-37, under 35 USC § 102 and § 103, set forth in the outstanding Office Action, and based on the disclosures of the document Modulo, No 206, page 1128, and Modulo, No 206, page 1128 (hereinafter called "Modulo") in view of Haekkinen, respectively, be reconsidered and the claims allowed for the following reasons.

It is noted, from par. 6 (Response to Arguments) of the Office Action, that the Examiner held valid the applicant's argumentation as to the lack of teaching of foundation soil compaction in Haekkinen.

The Examiner further considers that Modulo discloses *a method so that the ground below is able to support the overhanging loads,* which would teach each and every steps of claims 15 and 30.

Claim rejections under 35 USC § 102

In particular, it appears that the Examiner deems *the consolidation by injecting resin until a lifting of about 1-2mm of the overhanging structure is gauged,* taught by Modulo, as disclosing all of the steps claimed in claims 15 and 30.

However, it is respectfully submitted that Modulo teaches in fact the same void injection technique as Haekkinen, which has no relevance to the *compaction of the foundation soil.*

Note also the substantial similarity of the figures of Modulo and Haekkinen which convey the same teaching to the one with ordinary skills in the art, on a structure lifting/leveling technique by "in void" injection, under the bottom of the structure, to achieve a jack effect

Thus the claim rejections under 35 USC § 102 appear not to be consistent with:

-During patent examination the pending claims must be "given the broadest reasonable interpretation consistent with the specification". In re Prater, 415 F.2d 1383, 1404-05, 162 USPQ 541, 550 –51 (CCPA 1969).

and

-The broadest reasonable interpretation of the claims must also be consistent with the interpretation that those skilled in the art would reach. In re Cortright 163 F. 3d 1353, 1359, 49 USPQ2d 1464, 1468 (Fed. Cir. 1999).

(MPEP 2111),

The "foundation soil" has the generally recognized meaning both in the pertinent art, and is consistently defined in the disclosure of the specification as:

a soil mass that extends away from and under a built foundation structure for a depth covered by the pressure bulb or "at least twice the least width of the footing or mat foundation, 4 times the width ..."

-note the original specification, page 9, lines 24-27, page 11, lines 8-14 and mentioned figures, and the specification as amended at page 2, after line 22, with the letter of 02/22/2001, and also the evidence submitted with the applicant's previous submissions, such as :

a-CBD-148- Foundation Movements,

b-EM 1110-1-1904, 30 Sep 90 of the "Department of the Army U.S. Army Corps of Engineers; (pages 1-7, 1-9 and others).

(available on the Internet –www.usace.army.mil/publications/eng-manuals);

c-Appendix B - Geology & Soils Glossary of the Design & Construction

Standards, page 9, (available on the Internet); and

d-Enclosure 1 to the letter filed by the applicant on 01/21/2002, "La soluzione magica",

In a wholly different method, Modulo:

- teaches only injecting resin in voids, under the foundation;
- only teaches that the *injection holes are of about 15mm of diameter* and shows in the sole figure, substantially identical to that of Haekkinen, that injection is made through a hole made through a pavement, in a void, and that the injection produces a compaction of the soil under the void (see term "*Compattazione*" under the void), and that *huge amounts of material are often required which, in some cases, compress the ground below by tens of centimeters;*
- teaches *laser level control to achieve a very high accuracy of the lifting* and *injecting resin until a lifting of about 1 to 2 mm of the overhanging structure is achieved;*

Thus, as regards **claims 15 and 30**, Modulo fails to teach at least:

(a) increasing the bearing capacity of foundation soils for built structures,

(since Modulo teaches filling voids **"under the structure subjected to settlement or, anyway to reinforce it by filling up the voids between the ground and the structure"** built foundation of a sunken building and compressing the soil under the void)

(b) providing a plurality of holes spaced from each other deep in the foundation soil;

(Modulo is completely silent on how or where the injection holes are drilled and it only shows an **injection through a pavement in an immediately underlying void)**

c) producing compaction of the soil contiguous to the injection zone;

(Modulo teaches only compression of the soil under the structure, from above, by virtue of force exerted from the void filled up with expanding resin pressed directly by the structure)

d) constantly monitoring level variations of the soil and/or built structures overlying the injection zone to detect the moment when the built structures and/or the soil surface, overlying said injection zone, begins to raise which is the moment in which the compaction of the soil has reached levels generally higher than a required minimum value at which the soil lying below and around said injection zone withstands and rejects dynamic and static weights exerted thereon by said built structures and by overlying and adjacent soil masses,

(since Modulo does not teach a the soil and/or built structure to detect a moment when..., but only teaches "**injecting resins until a lifting of about 1-2mm is gauged**")

In addition, in relation with **claim 30**, Modulo fails to teach :

a) -injecting into the soil, through said holes, said substance which expands as a consequence of a chemical reaction, the injection being performed continuously along rising columns;

(since Modulo teaches injecting resin, through a tube passing through a hole in a pavement, in a void space, there is neither deep hole(s) nor injection column shown or mentioned whatsoever)

b) -producing compaction of the soil contiguous to each substance injection zone due to expansion of said substance injected into the foundation soil which forms, along said columns, tree-like shapes with irregular configuration including

protrusions, bumps and projections produced by different resistance to compaction of the foundation soil and due to voids, interstices or fractures present under said structure and into the foundation soil;

(since Modulo only teaches injecting through a hole through the pavement –settled structure- in a void space underneath)

In relation with the alleged inherent disclosure rejection, not mentioned by the Examiner in the outstanding Final Office Action but stated in the previous Office Action, of the feature ...*tree-like shapes*..., it is again submitted that only one hole through the pavement structure up to the void space underneath, **is taught and shown** in Modulo. There is no column neither formed nor inherently formable in holes made deep in the foundation soil in which the resin forms or may form tree-like shapes.

Note please, in claim 30 that the injection of the expandable substance is made *along rising columns in holes deep in the foundation soil*, and that the *tree-like shapes form along said columns*.

The generic reference to "The Uretek procedure" in the last paragraph of the English translation bears neither explicit reference nor implicit teaching that more holes are made for the same void filling and foundation region lifting.

It only states the injection holes the technique requires (in various instances and in different sites) have (generally) a certain, (reduced) diameter, so that they do not "disturb" surrounding activities by noise odor or dirt.

Accordingly, the applicant believes that there is no inherent teaching in Modulo to the mentioned column-tree-like configuration of claim 30.

The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or

characteristic . *In re. Rijckaert, 9.*

and

To establish inherency, the extrinsic evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and it that it would be so recognized by persons of ordinary skill. *USPQ 323, 326 (CCPA 1981).*

(MPEP 2112)

It ensues that neither explicit nor inherent information is or may be conveyed by the Modulo to the one having ordinary skills in the art, which corresponds to the steps claimed in claims 15 and 30, as set forth in 35 USC § 102.

The reference cited Modulo, no. 206, fails in fact to disclose *"each and every element as set forth in the claim, either expressly or inherently"*, Verdegaal Bros. V. Union Oil Co. Of California 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987);

and

The cited reference Modulo fails to meet the disclosure criteria that, "the *identical invention must be shown in as complete detail as is contained... in the claim*", Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989);

<u>Claim rejections under 35 USC § 103</u>

Moreover, in view of the above, the combination of teachings from Modulo and Haekkinen set forth in the claim rejections under 35 USC § 103 appears to lack proper basis.

In addition to the features mentioned above, as lacking from Modulo, it is further submitted, in relation with claims 36 and 37, that <u>both</u> Modulo and Haekkinen are also silent on :

a)-establishing appropriate treatment levels located at different depths in a foundation soil requiring bearing capacity increasing, said foundation soil being at least that part of soil having to withstand dynamic and static weights exerted by a built structure and by overlying and adjacent soil masses;

(Modulo only teaches acknowledging and repairing settled structure by lifting them through filling up of the voids formed underneath)

b)-providing a plurality of holes spaced from each other deep in the foundation soil so as to reach said treatment levels;

(Modulo shows only one injection hole through a pavement up to a void in which resin is injected through a tube)

c)- -injecting into the soil, through said holes, said substance which expands as a consequence of a chemical reaction;

(since Modulo teaches injecting through a pavement, in a void space)

d)-producing compaction of the soil contiguous to each substance injection zone by way of the expansion of said substance injected into the foundation soil;

(since Modulo teaches compaction of the only the soil under the void)

e)-estimating the bearing capacity achieved in the foundation soil treated with expanding substance injections by constantly monitoring the level of the soil surface and/or built structure overlying the injection zone to detect a moment when the built structure and/or the soil surface, overlying said injection zone, begins to raise which is the moment when the compaction of the soil due to the substance expansion has reached levels generally higher than a required

minimum value at which the soil lying below and around said injection zone withstands and rejects dynamic and static weights exerted thereon by said built structures and by overlying and adjacent soil masses.--

(since Modulo does not teach a the soil and/or built structure to detect a moment when..., but only teaches "**injecting resins until a lifting of about 1-2mm is gauged**"),

and, respectively

a) -*detecting reaching of said minimum compaction value required by constantly monitoring level variations of the soil surface and/or of the built structure overlying said injection zone to detect a moment when the built structure and/or the soil surface, overlying said injection zone, begins to raise, which is the moment when the soil lying below and around said injection zone withstands and rejects upwardly the dynamic and static weight exerted thereon by said built structures and overlying and adjacent soil masses;*

(since Modulo does not teach a the soil and/or built structure to detect a moment when..., but only teaches "**injecting resins until a lifting of about 1-2mm is gauged**"),

In the applicant's view, such objective facts fully justify a reconsideration of the rejection of claims 15-37, pending in the application, and an allowance thereof.

Nevertheless, should the Examiner deem that more clear definition for the basic feature of the provision of the holes "deep into the foundation soil" is needed in claims 15 and 30, to indicate that the holes are made deep in the soil away from the foundation structure, a new amendment to the claims 15 and 30 is hereby submitted for the Examiner's approval.

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It is respectfully requested that the objective facts and evidence herein submitted be thoroughly assessed by the Examiner and the rejections to claims 15-37 be withdrawn.

In alternative, should the Examiner deem more suitable, applicant is willing to accept allowance of the claims 15-37, with the claims 15 and 30 as herein amended.

Favorable action is respectfully solicited.

Respectfully submitted,

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